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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,074	09/05/2003	Vincent Demoulin	PF020110	1366

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EXAMINER	
PATHAK, SUDHANSHU C	
ART UNIT	PAPER NUMBER
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/656,074	DEMOULIN ET AL.	
	Examiner	Art Unit	
	Sudhanshu C. Pathak	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Sept. 5th, 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *Sept. 5th, 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-5 are pending in the application.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: The drawing do elements are not labeled i.e. element 4 should be labeled as a "Frequency Changer", similar correction is required for all the elements. Each corrected drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.
The abstract should be in narrative form and generally **limited to a single paragraph** on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The abstract discloses a second paragraph "Figure to be published: single figure".

4. The abstract is objected to because of the following informalities:

The abstract discloses acronyms such as "OFDM" and "RFC", it is recommended to disclose complete form of the acronyms. A suggested corrections would be "Orthogonal Frequency Division Multiplexing (OFDM)" & "Radio Frequency Channel (RFC)".

Appropriate correction is required.

Claim Objections

5. Claims 1 & 5 are objected to because of the following informalities:

The claim(s) discloses an acronym such as "OFDM", it is recommended to disclose complete form of the acronyms. A suggested correction would be "Orthogonal Frequency Division Multiplexing (OFDM)".

Appropriate correction is required.

6. Claim 1 provides for the use of a "method for selecting a transmission channel...", but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. The claim merely recites a use without any active, positive steps delimiting how this use is actually practiced. The claim(s) are narrative in form and replete with functional or operational language. A suggested correction would be "estimating the binary error rate for each transmission channel.....".

7. Claim 5 is objected to as failing to clearly define the invention.

The claim(s) are narrative in form and replete with functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. The claim(s) must be in one sentence form only. Note the format of the claims in the patent(s) cited. A suggested correction is: "A receiver of OFDM signals with antenna diversity, for implementing a method for selecting a transmission channel, comprising: a plurality

of antennas; an OFDM signal processing chain coupled to the antennas; a switch shifted so as to connect the input of the signal processing chain to the antenna.....".

Claim Rejections - 35 USC § 101

8. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 1-4 are rejected under 35 U.S.C. 101.

In regards to Claims 1-4, the claims discloses a process (method) that manipulates only number, abstract concepts or ideas or representing any of the foregoing, the claims are not being applied to an appropriate subject matter.

In regards to Claim 1 (independent Claim), Claim 1 merely discloses an algorithm (functional descriptive steps) implemented as a software, producing no practical application, and do not define any structural and functional interrelationship between the computer programs and other claimed elements of a computer which permit the computer program functionality to be realized, thereby producing no tangible, concrete and useful results. (See Pages 52-54 of the Interim Guidelines).

A suggested correction is to include "selecting an antenna based on the output of the neural network".

10. In regards to Claims 2-4 are inherently rejected as being dependent on above rejected independent claim.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroaki (EP 1065804 A2) in view of Hanik et al. (6,965,736).

In regards to Claim 1, Hiroaki discloses a method for selecting a transmission channel from several channels of a receiver of OFDM radio signals with antenna diversity (Abstract, lines 1-8 & Fig.'s 4, 7, elements 107-112) {Interpretation: The reference discloses an OFDM receiver with antenna diversity (multiple receiver antennas) and selecting the appropriate antenna}. Hiroaki further discloses the channel selection based on received amplitude levels (Abstract, lines 1-5 & Page 4, lines 45-51 & Fig. 4, elements 109-112) {Interpretation: The signal after (output) of the FFT is interpreted as data representative of the frequency response of the transmission channel as is also disclosed in the instant application in the specification on Page 3, lines 20, 23-25 wherein the fast fourier transform calculation module calculates the data representative of the frequency response of the transmission channel}. However, Hiroaki does not disclose estimating the binary error rate by feeding the frequency response of the transmission channel into a neural network.

Hanik discloses a method for monitoring (estimating) transmission quality wherein the amplitude of the signal is inputted into a neural network and classified according to bit error rate (Column 1, lines 43-54 & Column 2, lines 39-50, 55-60 & Column 3, lines 1-5, 59-67 & Fig. 1, elements "histogram", "Eval. Using NN" & Fig. 3)

{Interpretation: The reference discloses inputting the received signal characteristic into the neural network for estimating the signal quality as defined by the BER}. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Hanik teaches implementing a neural network for estimating the signal quality (BER) and this is implemented in the method as described in Hiroaki so as to be able to estimate the signal quality (BER) for each antenna branch by assessing the signal amplitude (direct assessment) without having to decode the received signal, thus avoiding intensive decoding processing and selecting the antenna based on BER and amplitude. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention that selection of the antenna is performed by selecting the antenna with the lowest BER thus increasing the quality of the signal received.

In regards to Claim 2, Hiroaki in view of Hanik discloses a method for selecting a transmission channel from several channels of a receiver of OFDM radio signals with antenna diversity as described above. Hiroaki further discloses the data representative of the frequency response of the transmission channel are diverted in the receiver at the output of a module for calculating the fast Fourier transform (Fig. 4, elements 109-111) {Interpretation: The reference discloses diverting the output of the FFT module into the diversity control section}. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Hiroaki in view of Hanik satisfies the limitation of the claim.

In regards to Claim 3, Hiroaki in view of Hanik discloses a method for selecting a transmission channel from several channels of a receiver of OFDM radio signals with antenna diversity as described above. Hiroaki further discloses Hiroaki further discloses the channel selection based on received amplitude levels (Abstract, lines 1-5 & Page 4, lines 45-51 & Fig. 4, elements 109-112) {Interpretation: The signal after (output) of the FFT is interpreted as data representative of the frequency response of the transmission channel as is also disclosed in the instant application in the specification on Page 3, lines 20, 23-25 wherein the fast fourier transform calculation module calculates the data representative of the frequency response of the transmission channel}.

Hanik further discloses the neural network undergoing learning to evaluate the received signal based of specified parameters (Column 3, lines 18-23, 65-67 & Column 4, lines 1-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Hiroaki in view of Hanik satisfies the limitations of the claims. However, Hanik discloses learning based on the received signal amplitude and not power. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that there is no criticality in selecting on the basis of power this is a matter of design choice depending on the type of signal monitored and the system in which the neural network is implemented. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Hiroaki in view of Hanik satisfies the limitation of the claim.

In regards to Claim 4, Hiroaki in view of Hanik discloses a method for selecting a transmission channel from several channels of a receiver of OFDM radio signals with antenna diversity as described above. Hanik further discloses the model of the neural network is a multilayer perceptron model (Fig. 3, element "Multi-layer perceptron"). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Hiroaki in view of Hanik satisfies the limitation of the claim.

In regards to Claim 5, Hiroaki discloses a receiver of OFDM signals with antenna diversity (Fig. 4, elements 107-115) comprising an OFDM signal processing chain (Fig. 4, elements 113-115) whose input is linked to a plurality of antennas (Fig. 4, elements 107-108) by way of a switch shifted so as to connect the input of the signal processing chain to the antenna which provides a signal exhibiting the largest amplitude (Fig. 4, elements 111-112). However, However, Hiroaki does not disclose estimating the binary error rate by feeding the frequency response of the transmission channel into a neural network.

Hanik discloses a method for monitoring (estimating) transmission quality wherein the amplitude of the signal is inputted into a neural network and classified according to bit error rate (Column 1, lines 43-54 & Column 2, lines 39-50, 55-60 & Column 3, lines 1-5, 59-67 & Fig. 1, elements "histogram", "Eval. Using NN" & Fig. 3) {Interpretation: The reference discloses inputting the received signal characteristic into the neural network for estimating the signal quality as defined by the BER}. Therefore, it would have been obvious to one of ordinary skill in the art at the time of

the invention that Hanik teaches implementing a neural network for estimating the signal quality (BER) and this is implemented in the receiver (in the diversity control section) as described in Hiroaki so as to be able to estimate the signal quality (BER) for each antenna branch by assessing the signal amplitude (direct assessment) without having to decode the received signal, thus avoiding intensive decoding processing and selecting the antenna based on BER and amplitude. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention that selection of the antenna is performed by selecting the antenna with the lowest BER thus increasing the quality of the signal received.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571)-272-3042.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sudhanshu C. Pathak
Examiner
Art Unit 2611